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10/685,649	10/16/2003	Katsuto Sumi	Q78006	5009

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EXAMINER	
PHAM, HAI CHI	
ART UNIT	**PAPER NUMBER**
2861	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/685,649	**Applicant(s)** SUMI ET AL.
	Examiner Hai C. Pham	**Art Unit** 2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.
  4a) Of the above claim(s) *1-4* is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *5-34* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *23 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☒ All b)☐ Some * c)☐ None of:
    1.☒ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date *03/23/04*.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-4, drawn to the pulse width modulation of the light beam in recording an image, classified in class 347, subclass 252.

   II. Claims 5-34, drawn to setting an effective power level for a laser beam in recording an image even if the light beam is defocused, classified in class 347, subclass 253.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case, the different inventions are as follows: the invention I is related to the generation of a drive signal for driving a light source emitting a light beam in recording an image, wherein the drive signal is formed by combining a pulse width modulated signal and a pulse-like first or second signal at one of the edges of the pulse width modulated signal while the invention II is tailored to set a power level of the light beam for forming an image on a photosensitive material, wherein the power level is set depending on the threshold value of the photosensitive material, the power level being fixed even if a defocus of the light beam occurs.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with the personnel of the Office of Attorney Daryl Mexic on August 12, 2005 a provisional election was made without traverse to prosecute the invention II, claims 5-34. Affirmation of this election must be made by applicants in replying to this Office action. Claims 1-4 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 20, 24 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20:

- The following limitation "wherein said step of correcting fluctuation in sensitivity includes controlling at least one of: ... an image recording time" appears to be redundant since the parent claim 19 already recites "controlling a recording time". It also appears to be ambiguous in that "controlling an image recording time" becomes optional as it can be selected from a variety of options.

Claim 24:

- Similarly, the following limitation "said step of correcting fluctuation in sensitivity includes controlling at least one of ... said image recording time" appears to be redundant since the parent claim 23 already recites "controlling a recording time". It also appears to be ambiguous in that "controlling an image recording time" becomes optional as it can be selected from a variety of options.

Claim 28:

- The following limitation "said step of correcting fluctuation in sensitivity includes controlling at least one of: ... said image recording time" appears to be redundant since the parent claim 27 already recites "controlling a recording time". It also appears to be ambiguous in that "controlling an image recording time" becomes optional as it can be selected from a variety of options.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Miyagawa et al. (U.S. 6,208,371).

Miyagawa et al. discloses an image forming method comprising scanning a photosensitive material (recording medium F) with a light beam (laser beam L), and recording an image (Fig. 1), wherein a power of said light beam is set to a power of a level (power level or integrated intensity A) at which a recording line width or a recording dot size, which is determined depending upon a threshold value for said photosensitive material to blacken, is substantially fixed even if defocus occurs (the width of the linear image being defined by the coloring range "c" determined by the coloring threshold of the recording medium F while the power level of the laser beam is set at "A" level, the width of the linear image remains the same even if the laser beam is defocused as represented by the power level "B" of the defocused laser beam on the surface of the recording medium) (Fig. 5) (col. 4, line 50 to col. 5, line 2).

12. Claim 34 is rejected under 35 U.S.C. 102(b) as being anticipated by Maekawara et al. (U.S. 6,121,993).

Maekawara et al. discloses a method for correcting the density fluctuation of the photographic print in an image forming apparatus, which comprises an exposure machine (exposure heads 16R, 16G, 16B) for forming an image by scanning a photosensitive material (photographic paper sheet 11), which is supported by a photosensitive material supporting unit (drum 15), with a light beam irradiated from a light source (LED), and a development processing machine (developing machine, Fig. 4) for subjecting an exposed photosensitive material to development processing, said image forming apparatus further comprising a acquiring unit (densitometer, Fig. 6) for acquiring at least one of a measurement result of a density [or mesh %] of a given sample, which is exposed by said exposure machine and subjected to the development processing by said development processing machine, and characteristics of exposure in said exposure machine and the development processing in said development processing machine (the density produced from a test chart being measured by the densitometer such that the variation of the development characteristics and the exposure time is corrected) (col. 25, line 54 to col. 26, line 30), and a control unit (mechanism control and/or timing control, Fig. 6) for at least one of exposure conditions in said exposure machine and development processing conditions in said development processing machine based on information acquired by said acquiring unit.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa et al.

Miyagawa et al. discloses all the basic limitations of the claimed invention including the power level of the laser beam being greater than the coloring threshold level but fails to explicitly teach the power of the light beam at best focus is of a level at which an intensity level of from 40% to 60% of a peak intensity of said light beam is substantially equal to said threshold value for said photosensitive material to blacken, and the power of the light beam being 1.8 to 2.2 times a reference exposure power. It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the power level of the laser beam within the ranges as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

15. Claims 8-10, 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa et al. in view of Henderson et al. (U.S. 5,352,495).

Miyagawa et al. discloses all the basic limitations of the claimed invention except for the power of the light beam being differentiated at an edge part and a non-edge part of a recorded image, wherein the power of the light beam at said non-edge part of the recorded image is smaller than said power of the light beam at said edge part of the recorded image, wherein said edge part of the recorded image is said side perpendicular to the main scanning direction and said side in the main scanning direction, controlling a recording time required for said recorded image according to said differentiated exposure power of the light beam.

Henderson et al. discloses a laser beam exposing the surface of a material with a uniform energy delivered across a major portion of the transverse width of the laser beam by using an unfocussed beam of a ring mode configuration, wherein the power of the laser beam at the center portion of the recorded image is smaller than the power of the laser beam at the edge portion of the recorded image (the laser beam having an outer ring with or without the center peak) (col. 3, lines 26-30), the annular shape of the laser beam as so configured being thus perpendicular to and along the main scan direction of the laser beam. Henderson et al. further teaches the exposure duration of any scanned point of the surface of the paper web being properly controlled.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to configure the laser beam of the device of Miyagawa et al. to have a ring mode as taught by Henderson et al. The motivation for doing so would have been to obtain a reasonable uniform energy delivery across a major proportion of the beam width transverse to the scan direction as suggested by Henderson et al.

On the other hand, although Henderson et al. teaches the edge of the annular-shape laser beam corresponding to a portion of the pixel, Henderson et al. does not explicitly disclose that edge part corresponding to 0.5 to 4 pixels. It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the edge part of the laser beam within the range as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regard to claims 14, 15, although Miyagawa et al. discloses the power level of the laser beam being greater than the coloring threshold level, Miyagawa et al. however fails to explicitly teach the power of the light beam at best focus is of a level at which an intensity level of from 40% to 60% of a peak intensity of said light beam is substantially equal to said threshold value for said photosensitive material to blacken, and the power of the light beam being 1.8 to 2.2 times a reference exposure power. It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the power level of the laser beam within the ranges as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

16. Claims 17-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa et al. in view of Henderson et al. and Maekawara et al.

Miyagawa et al. in view of Henderson et al. discloses all the basic limitations of the claimed invention (please refer to the rejection based on Henderson et al. teaching in the above paragraph 15) except for subjecting the photosensitive material to exposure and development processing to form a predetermined pattern, measuring a density of the sample, calculating a difference between the measured density and a specified density, and correcting fluctuation in sensitivity due to factors of fluctuation in sensitivity in an exposure and development processing system for the photosensitive material based on the calculated difference.

Maekawara et al. discloses a method of correcting the density fluctuation of the photographic medium due to the variation of the development characteristics such as the sensitivity fluctuation of the developing machine as well as the dispersion of the light quantity of the LED light sources by subjecting the photosensitive material to exposure and development processing to form a predetermined test chart, measuring the density of the test chart with a densitometer and memorized, calculating the density difference from a standard density (e.g., gs) based on which the correction is made for each of the density fluctuation factors, e.g., variation of the development characteristics and exposure duration (col. 23, starting at line 24).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the method of correcting the density fluctuation of the developing machine in the device of Miyagawa et al. as taught by Maekawara et al. The motivation for doing so would have been to prevent streak irregularities in the image quality as suggested by Maekawara et al.

With regard to claims 29 and 30, although Miyagawa et al. discloses the power level of the laser beam being greater than the coloring threshold level, Miyagawa et al. however fails to explicitly teach the power of the light beam at best focus is of a level at which an intensity level of from 40% to 60% of a peak intensity of said light beam is substantially equal to said threshold value for said photosensitive material to blacken, and the power of the light beam being 1.8 to 2.2 times a reference exposure power. It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the power level of the laser beam within the ranges as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

17. Claims 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haskai (U.S. 3,787,888) in view of Maekawara et al.

Haskai discloses an image recording apparatus comprising a detecting unit (photodetectors 48 and 50), which detects at least a part of an edge part of an image signal to be recorded (the photodetectors 48 and 50 sense the intensities of the laser beam at two different points X and Y of the laser beam profile, including the edge part of the laser beam) (Fig. 2), a parameter setting unit which sets parameters for processing, which increases a light quantity at an edge part perpendicular to a main scanning direction, based on image output information (the laser beam having an annular shape at the edge part, e.g., profile B or C, where the light quantity is increased and controlled by the read/write control 38, which also regulates the laser beam by means of the modulator 15 based on the image data) (Fig. 1)

Haskai fails to teach the light source being driven based on the timing information for image recording, and the image recording time control.

Maekawara et al. discloses an image forming apparatus in which the exposure time is controlled so as to compensate for the fluctuations of the sensitivity of the recording medium and the dispersion of the light intensity of the light source.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the time control for light exposure in the device of Haskai as taught by Maekawara et al. The motivation for doing so would have been to compensate for the dispersion of the light intensity of the light source.

18. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haskai in view of Maekawara et al., as applied to claim 31 above, and further in view of Miyagawa et al.

Haskai, as modified by Maekawara et al., discloses all the basic limitations of the claimed invention including the annular edge part of the laser beam being perpendicular to a main scanning direction but except for the power of said light beam is set to a power of a level at which a recording line width or a recording dot size, which is determined depending upon a threshold value for said photosensitive material to blacken, is substantially fixed even if defocus occurs.

Miyagawa et al. discloses an image forming method comprising scanning a recording medium F with a laser light beam L, and recording an image, wherein a power of said light beam is set to a power of a level A, e.g., integrated intensity A, at which the width of the linear image as defined by the coloring range "c" is determined by the coloring threshold of the recording medium F, the width of the linear image remains fixed even if the laser beam is defocused as represented by the power level "B" of the defocused laser beam on the surface of the recording medium (Fig. 5) (col. 4, line 50 to col. 5, line 2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set the power level of the laser beam in the device of Haskai at a proper level where the dot size remains fixed even if the laser beam is defocused as taught by Miyagawa et al. The motivation for doing so would have been to retain the dot sharpness even if the laser beam is defocused.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hai Pham

HAI PHAM
PRIMARY EXAMINER

August 25, 2005